

Appendix B

VCM Checklist and Fact Sheet

Accelerated Corrective Action (ACA) Checklist and Field Work Authorization Form

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PRS Number: 21-011(k) ☒ HSWA ☐ Non-HSWA

Yes	No	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Fact sheet describing planned activities is complete and attached to checklist.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	COPC(s) for human health risk (HH), ecological risk (ECO), or other requirements are known or will be determined during accelerated site characterization.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Nature and extent of contamination is defined or accelerated site characterization is planned as part of this action to define nature and extent and to guide cleanup.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Cleanup levels/preliminary remediation goals (PRGs) are appropriate.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Remedy is obvious.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Time for removal is less than six months.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Remedy is final.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Land use assumptions are straightforward.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Treatment, Storage, and Disposal (TSD) Facilities are available for waste type and volume.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Cleanup cost is reasonable for the planned action and meets accelerated decision logic criterion for decision to proceed with ACA.
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Briefing for NMED is required.

Explain criteria not checked above:

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 PRS Number: 21-011(k) ☒ HSWA ☐ Non-HSWA

 Upon reviewing the Accelerated Corrective Action Fact Sheet and the criteria checklist above, the appropriate Accelerated Corrective Action approach for the PRS(s) is (check one): ☐ VCA ☒ VCM

Signatures of the Representative for UC-Laboratory, DOE-LAAO, and NMED-HRMB:

 UC: John Hopkins, MDA Focus Area Leader _____ (Date) _____
(Print Name and Title, then Sign)

 DOE: Woody Woodworth, LAAO _____ (Date) _____
(Print Name and Title, then Sign)

 NMED: Vicki Maranville, NMED-HWB _____ (Date) _____
(Print Name and Title, then Sign)

The undersigned have reviewed the final plan and believe that it fully satisfies the appropriate Accelerated Corrective Action Approach.

Signatures of the Representative for UC-LANL and DOE-LAAO

 UC: _____ (Date) _____
(Print Name and Title, then Sign)

 DOE: _____ (Date) _____
(Print Name and Title, then Sign)

Action	Date	Correspondence ID
VCA or VCM plan submitted to NMED		
NOD or RSI received from NMED		
Laboratory response to NOD or RSI		
NMED approval of VCA or VCM plan		

After reviewing the VCA or VCM plan for the site(s) listed above and believing that the ACA process and VCA or VCM criteria have been met, I authorize the fieldwork to proceed.

DOE ER Program Manager _____ (Signature) _____ (Date)

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Voluntary Corrective Measure Fact Sheet for PRS 21-011(k) Confirmation Sampling and Removal of Residual Contamination

SRS: 21-011(k) = 67**Erosion Matrix Score: 21-011(k) = 72**

OPERATIONAL HISTORY

Potential Release Site (PRS) 21-011(k) was the national pollutant discharge elimination system (NPDES)-permitted outfall (NPDES outfall no. EPA050050) for treated industrial wastewater from Buildings TA-21-35 and -257, the former industrial wastewater treatment plants (WWTP) at TA-21, and is listed in Module VIII of the Laboratory's Hazardous Waste Facility Permit. The PRS consists of a drain line from two wastewater treatment tanks that discharged to an outfall ditch, which channeled wastewater to the canyon rim, and down the hillside toward DP Canyon. The ditch is no longer visible; however, a 4-inch cast iron drain line is located approximately 55 feet north of the TA-21 perimeter road in the area where the outfall ditch would have ended. A gently sloping, rocky surface extends from the outfall pipe approximately 30 feet to the canyon rim.

TA-21, the former plutonium processing facility at LANL, began plutonium operations in 1945 and ceased operations in 1978. The first WWTP, TA-21-35 was activated in 1952 and operated until 1967 when the new WWTP, TA-21-257, came on line. Both facilities treated wastes from DP West and DP East consisting of liquids remaining after plutonium extraction and processing of radioactive materials for nuclear weapons and space rocket research projects. The treatment process mixed the raw waste with lime, ferric sulfate, and coagulant aids. The waste was then pumped to a flocculator and onto a settling tank. Settled effluent was pumped through a pressure filter and sampled to verify treatment. If the effluent was determined to be adequately treated, it was pumped to two final effluent holding tanks (tanks TA-21-112 and TA-21-113). From tanks TA-21-112 and TA-21-113, the wastewater was piped northeast toward DP Canyon and discharged on the north side of DP Mesa (Fig. 1.0-1). This wastewater contained a variety of radioactive and chemical constituents. Discharges of treated wastewater to the outfall were discontinued in the early 1990's; however, Building TA-21-257 is still used for pretreatment of wastewater prior to discharge to the TA-50 waste line.

Previous Investigations and Contaminants of Potential Concern

PRS 21-011(k) was investigated in 1988 by DOE and by the ER Project in 1992 and 1993 and reported on in 1995 in the Final Draft for the OU 1106 Addendum to Phase 1B, 1C Report (LANL 1995, 52350). The initial radiation survey and soil sampling performed at PRS 21-011(k) in FY92 indicated the presence of radionuclide contamination. Additional soil sampling and a radiation survey were performed during the FY93 field season to further define the extent of contamination found in FY92.

An interim action (IA) plan was prepared in 1996 (LANL 1996, 01-0042). The IA was implemented during 1996 and 1997 and described in the *Interim Action Report for TA-21, Potential Release Site 21-011(k)*, submitted to NMED on April 10, 1997 (LANL 1997, 55648). The objectives of the IA were to remove a portion of the radionuclide source term from the outfall area of the PRS and install storm water control measures as a best management practice (BMP). Soil excavated from PRS 21-011(k) during the 1996 IA (390 cubic yards) was characterized in the field and transported to TA-54, MDA G for disposal. Storm water controls were installed in 1997 and upgraded in August 1999. The controls are routinely inspected and maintained by LANL ESH-18 representatives.

The COPCs for this PRS include americium-241, cesium-137, plutonium-238 and -239, and strontium-90. Although analytical results from the 1988, 1992 and 1993 investigations did not identify non-radioactive, RCRA-regulated organic and inorganic chemicals as COPCs, waste characterization samples and a percentage of confirmation samples will be submitted for analysis of metals, SVOCs, and radionuclides. VOCs are not anticipated to be present at the surface because they were not detected when 390 cubic

yards of soil were excavated during the IA in 1996. However, VOCs will be included in the analytical suite for a percentage of post excavation confirmation samples and waste characterization samples.

VCM Rationale

SWMU 21-011(k) is located on the north side of DP mesa on a hillside that leads to DP Canyon. The most northern extent of the slope's toe is within the high water table of the DP Canyon streambed. SWMU 21-011(k) has been identified as the primary source of radionuclide contamination in sediments in DP Canyon (LANL 1999, 63915). The existing radionuclide inventory in surface soils and sediment at the site is approximately four times greater than the inventory in the sediments in DP Canyon. Because of the site's high potential for erosion (erosion matrix score of 72 out of 100, Appendix C), there is the potential for radionuclides from the site to increase the radionuclide inventory in DP Canyon. Therefore, remediation of the site is considered a priority for both LANL and the New Mexico Environment Department (NMED).

SWMU 21-011(k) is located on DOE property that will remain under institutional control for at least the next 100 years. Land use for TA-21 is, and will continue to be, industrial under DOE ownership and control. However, the SWMU 21-011(k) site is not a typical industrial site as it is located on a steep hillside that slopes to the bottom of a canyon. Consequently, the more realistic trail user scenario is proposed for screening soil and sediment areas with potentially elevated radionuclide activity exceeding acceptable human health and ecological risk levels.

VCM Implementation

The Laboratory's ER Project will conduct the following activities to achieve the project objectives. The 4-inch cast iron drain line that delivered the contaminating industrial effluent to the site will be excavated and disposed. A disposal cell will be excavated, below grade, and within the SWMU boundary where solidified wastes will be placed for reburial. Contaminated soils/tuff will be excavated from "hot spots" and stockpiled for solidification. Excavation and removal of contaminated material will continue until residual concentrations, averaged over 1 yd², do not exceed 150 pCi/g cesium-137 or 170 pCi/g americium-241 based on on-site gamma screening. The stockpiled contaminated material will be solidified, i.e., the contaminated material will be processed in a twin-shaft pugmill mixer with Portland cement, bentonite, and water, then moved and placed as a batch block of solidified material within the disposal cell. Samples will be taken from the block of material to ensure structural integrity. An estimated volume of 800 yd³ of material will be stabilized. Upon completion, the process equipment will be decontaminated and returned to the vendor.

Post excavation sampling and radiation surveys will be conducted to ensure that the DOE 5400.5 elevated activity criterion has been achieved. After confirmation sampling, site restoration will be performed to include re-contouring all excavated areas and placing and compacting ~4000 yd³ of clean borrow soils over the disposal cell and across the site. Following grading, placement, and compaction of clean soils, the site will be reseeded.

Anticipated Waste Types and Volumes

Three separate waste streams are anticipated from this VCA as presented in the following table.

Waste Stream	Waste Type	Anticipated Volume
Radionuclide-contaminated soil and tuff	Solid — LLW	2,000 yd ³
Radionuclide-contaminated decon water from heavy equipment	Liquid — LLW	250 gallons
PPE, plastic sheeting, disposable sampling equipment, and soil samples	Solid — LLW	10 yd ³

Estimated Cost

Based on current resource estimates, all waste generated during this VCA is expected to be disposed of at TA-54 as LLW at a cost of approximately \$1.2 million for waste disposal only. However, final disposal options will be re-evaluated during the VCA implementation planning process. With anticipated subcontractor costs and analytical costs the total estimated cost of this VCA is approximately \$2.2 million.

Schedule

The field work portion of this VCA is expected to begin in mid-FY01 and take approximately three months to complete. The fieldwork includes soil and tuff removal, confirmatory sample collection and analysis, waste management, and site restoration.

Reference List of Past Plans, Reports, etc.

Environmental Restoration Project, August 1999. "Evaluation of Sediment and Alluvial Groundwater in DP Canyon," Los Alamos National Laboratory report LA-UR-99-4238, Los Alamos, New Mexico. (Environmental Restoration Project 1999, 63915)

LANL (Los Alamos National Laboratory), May 1991. "RFI Work Plan for Operable Unit 1106, Section 15.4," Los Alamos National Laboratory Report LA-UR-91-962, Los Alamos, New Mexico. (LANL 1991, 07529)

LANL (Los Alamos National Laboratory), January 1995. "Final Draft for the OU 1106 Addendum to Phase 1B, 1C Report, TA-21," Los Alamos National Laboratory report LA-UR-94-4360, Los Alamos, New Mexico. (LANL 1995, 52350)

LANL (Los Alamos National Laboratory), 1996. "Interim Action Plan for TA-21: PRS 21-011(k)," Los Alamos National Laboratory report LA-UR-96-1609, Los Alamos, New Mexico. (LANL 1996, 54790.2)

LANL (Los Alamos National Laboratory), April 1997. "Interim Action Report for Potential Release Site 21-011(k) Discharge System," Los Alamos National Laboratory report, Los Alamos, New Mexico. (LANL 1997, 55648.2)